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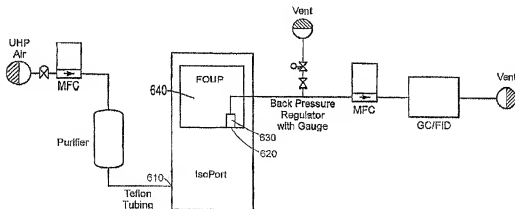
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For two-letter codes and other abbreviations, refer to the "Guide-  
lines Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: PURGING OF A WAFER CONVEYANCE CONTAINER



(57) Abstract: Embodiments of the invention are directed to methods and systems of purging of transfer containers, such as standardized mechanical interface (SMIT) pods. In particular, purified purge gases can purify front operated unified pods (FOUPs) and other non hermetically sealed transfer containers, such that the containers can be interfaced with a sealed chamber (e.g., a semiconductor processing tool) without detrimentally contaminating the environment of the sealed chamber with organics and other harmful contaminants. The methods and systems may be used to transfer objects, such as wafers, semiconductor components, and other materials requiring exposure to extremely clean environments, during electronic materials manufacturing and processing.

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## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US2005/003287

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H01L21/00 H01L21/68 B01D46/00 B01D50/00 F24F3/16

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01L B01D F24F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/124906 A1 (SUZUKI YOKO ET AL) 12 September 2002 (2002-09-12) paragraphs [0011], [0220]; figures 57A, 57B	1-12
X	paragraphs [0243], [0245]; figure 68	13-21
X	EP 1 067 583 A (EBARA CORPORATION) 10 January 2001 (2001-01-10) paragraph [0042]; table 1	1-12
X	paragraphs [0020], [0043]; figures 5, 9	13-21
X	US 5 644 855 A (MCDERMOTT ET AL) 8 July 1997 (1997-07-08) column 9, line 29 - column 10, line 5	1-12
X	EP 1 182 694 A (TOKYO ELECTRON LIMITED) 27 February 2002 (2002-02-27) paragraphs [0041] - [0063]; figures 1, 2	13-21
-/-		

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"S" document member of the same patent family

Date of the actual completion of the international search

2 August 2005

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Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

International Application No.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 169 272 A (BONORA ET AL) 8 December 1992 (1992-12-08) column 1, line 59 - column 2, line 28 -----	1-12

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2005/003287

## Box II Observations where certain claims were found unsearchable (Continuation of Item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international Application that do not comply with the prescribed requirements to such an extent that no meaningful international Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of Item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-12

This invention concerns a method of purifying a transfer container comprising the step of purging the transfer container with a gas having a certain concentration. The problem to be solved is to reduce device contamination.

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2. claims: 13-21

This invention is directed to a method and a system of transferring an object from a transfer container to a sealed chamber.

The problem to be solved is to improve the process control.

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2005/003287

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2002124906	A1	12-09-2002	JP 2002261159 A	13-09-2002
			EP 1343202 A1	10-09-2003
			WO 0247152 A1	13-06-2002
			TW 533174 B	21-05-2003
			US 2004187451 A1	30-09-2004
-----				
EP 1067583	A	10-01-2001	JP 2001077188 A	23-03-2001
			EP 1067583 A2	10-01-2001
			TW 550220 B	01-09-2003
			US 2002129707 A1	19-09-2002
			US 6364922 B1	02-04-2002
-----				
US 5644855	A	08-07-1997	NONE	
-----				
EP 1182694	A	27-02-2002	JP 3552656 B2	11-08-2004
			JP 2002076090 A	15-03-2002
			JP 3642729 B2	27-04-2005
			JP 2002164406 A	07-06-2002
			EP 1182694 A2	27-02-2002
			TW 501194 B	01-09-2002
			US 2002048509 A1	25-04-2002
-----				
US 5169272	A	08-12-1992	DE 69115292 D1	18-01-1996
			DE 69115292 T2	27-06-1996
			EP 0556193 A1	25-08-1993
			JP 3576162 B2	13-10-2004
			JP 6501815 T	24-02-1994
			WO 9207759 A1	14-05-1992
			US 5547328 A	20-08-1996
			US 5370491 A	06-12-1994
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